

ADDITIONAL NOTES ON THE ERIOCAULACEAE. LXI

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PAEPALANTHUS SERRALAPENSIS Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 167 & 482 (1971) and 2: 504, 512, 585, & 957. 1971; Moldenke, Phytologia 33: 153. 1976.

The type of this species was collected by Ludwig Riedel (no. 1067) "in glareosis siccis Serra da Lapa", Minas Gerais, Brazil, flowering in November, and is deposited in the Leningrad herbarium. An isotype was photographed by Macbride in the Berlin herbarium as his type photograph number 10620.

Kunth (1841) states that the species is related to P. argenteus (Bong.) Körn. He likewise points out that the "Tab. LXIV" cited by Bongard (1831) apparently was never published and probably exists only in the Leningrad library or herbarium. Ruhland (1903) cites only the original collection.

It should be noted here that the Eriocaulon latifolium of Smith is a valid species in that genus, while that of Arechavaleta is a synonym of what we now know as E. arechavaletae Herter.

Citations: BRAZIL: Minas Gerais: L. Riedel 1067 [Macbride photos 10620] (B—isotype, N—photo of isotype, N—photo of isotype, W—photo of isotype, Z—isotype).

PAEPALANTHUS SERRINHENSIS Alv. Silv., Fl. Mont. 1: 44—46, pl. 23. 1928.

Synonymy: Paepalanthus sercinhensis Alv. Silv. apud Wangerin in Just, Bot. Jahresber. 57 (1): 477, sphalm. 1937.

Bibliography: Alv. Silv., Fl. Mont. 1: 44—46 & 413, pl. 23. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 15 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 23. 1928.

This species is based on A. Silveira 802 from "In umbrosis secus margines caopeiras prope Serrinha, inter Grão Mogol et Itacambira", Minas Gerais, Brazil, in July, 1926, and is deposited in the Silveira herbarium. The species is known thus far only from the original collection. Silveira (1928) comments that the "Species a P. Itambeensis Alv. Silv. pilositate bractearum involucrentium et foliorum praecipue differt".

PAEPALANTHUS SESLERIOIDES Griseb., Cat. Pl. Cub. 224. 1866.

Synonymy: Dupatya seslerioides (Griseb.) Britton ex Moldenke, Phytologia 1: 334, in syn. 1939. Dupatya seslerioides (Griseb.)

Shafer ex Moldenke, Known Geogr. Distrib. Erioc. 31, in syn. 1946. Dupatya seslerioides Britton apud Hill & Salisb., Ind. Kew. Suppl. 10: 80. 1947.

Bibliography: Griseb., Cat. Pl. Cub. 224. 1866; Sauv., Fl. Cub. 164. 1871; Sauv., Anal. Acad. Sci. Habana 8: 50. 1871; Gomez de la Maza, Not. Bot. Sist. 49 & 110. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 2: 402. 1894; Urb., Symb. Ant. 1: 486. 1900; Ruhl. in Engl., Pflanzenreich 13 (4-30): 126, 140, & 292. 1903; Jennings, Ann. Carnegie Inst. 11: 88. 1917; Moldenke, N. Am. Fl. 19: 38-39. 1937; Moldenke, Phytologia 1: 334, 351-353, 355, 357, 358, 361, & 363. 1939; Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47 & 114. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 2: 402. 1946; León, Fl. Cuba, imp. 1, 1: 281. 1946; Moldenke, Known Geogr. Distrib. Erioc. 5, 31, & 54. 1946; Moldenke, Alph. List Cit. 1: 3, 63, 64, 66, 91, 92, 186, & 187. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 80. 1947; Moldenke, Alph. List Cit. 2: 412, 486, 487, 543, 583, 648, & 651 (1948), 3: 929 & 930 (1949), and 4: 1085, 1094, 1143, 1144, & 1304. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 44, 45, & 211. 1949; Moldenke, Phytologia 4: 204. 1953; Moldenke, Résumé 52, 54, 282, & 490. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 18: 10. 1969; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 184, 187, & 191. 1969; Moldenke, Fifth Summ. 1: 97, 99, & 485 (1971) and 2: 958. 1971; León & Alain, Fl. Cuba, imp. 2, 1: 281 & 428. 1974; Moldenke, Phytologia 30: 340. 1975.

The type of this species was collected by Charles Wright (no. 3234) in pinewoods at Hato Quemado, Los Almacijos, Pinar del Río, Cuba. Urban (1900) and Ruhland (1903) both comment that the species is "Paepalantho Lundii Koern. *similis et affinis*". Killip encountered it on white sand and white sand savannas on the Isle of Pines, growing in clumps, flowering in January and February. My wife and I found it growing in very great abundance on dry sandy savannas in the Laguna de Santa Maria section of Pinar del Río in close association with P. alsinoides C. Wright, P. lamarckii Kunth, Syngonanthus androsaceus (Griseb.) Ruhl., S. lagopodioides (Griseb.) Ruhl., Eriocaulon sigmoideum C. Wright, and E. fuliginosum C. Wright.

Jennings (1917) comments about his Isle of Pines collection "This plant agrees very closely with the description of the Cuban plant, although the leaves are shorter, about 3-5 cm. and the peduncles are shorter, being at the longest 13 cm. instead of 30 cm. This may possibly be found to be a variety of P. seslerioides, but a larger series of specimens are needed for study before such a decision can be made."

Additional citations: CUBA: Pinar del Río: Ekman 11031 (S, S), 11126 (S), 11033 (S), 17803 (S), 17810 (S); León 12881 (Mg-9923), 19466 (Mv); Marie-Victorin 58316 (Mv, Mv); Shafer 10882 (Ut-26813); C. Wright 3234 (Ca-937003-isotype, S-isotype, S-isotype). ISLA DE PINOS: Alain & Killip 2098 (Z), 2161 (Le); E. Blanco s.n. [Killip

45464] (Sm); Britton, Britton, & Wilson 14225 (S); Britton & Wilson 14319 (S); Ekman 11941 (S), 12068 (S), 12110 (S); Killip 42671 (Le), 42739 (Le), 42740 (Gg—401111, Le, Mu), 42754 (Le), 42829 (Le), 42833 (Le, S), 42913 (Le), 42999 (Le), 43819 (N), 44054 (S), 44544 (M1), 45363 (B, Mu), 45387 (Sm), 45490 (Sm), 45506 (Sm), 45558 (Sm), 45586 (Sm), 45610(Sm); Marie-Victorin & Alain 167 (Vi, Vi); Morton 10013 (W—2350690).

PAEPALANTHUS SESSILIFLORUS Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 361—362, pl. 48, fig. 1. 1863.

Synonymy: Eriocaulon sessiliflorum Mart., Flora 24: Beibl. 2: 60, hyponym. 1841. Dupatya sessiliflora (Mart.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya sessiliflora Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902. Dupatya sessiliflorum Bourdu, Bot. Soc. France 104: 156 & 158, in syn. 1957.

Bibliography: Mart., Flora 24, Beibl. 2: 60. 1841; Steud., Syn. Pl. Glum. 2: [Cyp.] 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 361—362, 499, & 506, pl. 48, fig. 1. 1863; Benth. & Hook. f., Gen. Pl. 3 (2): 1023. 1883; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 879 (1893) and imp. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 12, 152, 154, 284, 287, & 292. 1903; Thiselet.-Dyer, Ind. Kew. Suppl. 2: 402. 1904; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 51. 1930; Stapf, Ind. Lond. 4: 519. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 879 (1946) and imp. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 16, 31, 40, & 54. 1946; Moldenke, Alph. List Cit. 3: 710. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Phytologia 4: 204. 1953; Bourdu, Bull. Soc. Bot. France 104: 156 & 158. 1957; Moldenke in Dawson, Los Angeles Co. Mus. Contrib. Sci. 7: 6. 1957; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 145. 1959; Moldenke, Résumé 102, 282, 292, & 490. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 879 (1960) and imp. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 12: 4 (1965) and 18: 10. 1969; Moldenke, Phytologia 19: 35. 1969; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 158. 1969; Moldenke, Fifth Summ. 1: 167, 485, & 486 (1971) and 2: 512 & 958. 1971; Moldenke, Phytologia 28: 193--194 & 436 (1974) and 31: 385. 1975.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 48, fig. 1. 1863.

This species is based on Luschnath 33 [distributed as Martius 557] from "nicht unweit dem Meeresstrande bei Caballo, Bahia", Brazil, deposited in the herbarium of the Botanische Staatssammlung in Munich, where it was photographed by Macbride as his type photograph number 18727. Ruhland (1903) cites only these two numbers and comments that the "Species minime generis". It has been found growing on sandstone outcrops by more recent collectors,

flowering in April, August, and September.

Even though the binomial, Eriocaulon sessiliflorum Mart., was effectively published by Martius in 1841 and is listed in the original edition of the "Index Kewensis", under the present edition of the Code of Botanical Nomenclature this does not constitute valid publication and is to be disregarded even though Martius cites his no. 557 as the type and there is therefore no doubt as to what the taxon is to which he was applying the name. His publication reads, in toto: "557 Eriocaulon sessiliflorum. In campis ad Caballos, praedium prov. Bahiensis. Augusto. Dryas."

Additional citations: BRAZIL: Bahia: Luschnath 33 [Martius 557; Macbride photos 18727] (B—isotype, Br—isotype, Br—isotype, Mu—type, N—isotype, N—photo of type, W—photo of isotype), s.n. [Brasilia] (B); Murça Pires 1792a (Be—49973). Goiás: E. Y. Dawson 14592 (Im, Z). Maranhão: Murça Pires & Black 2207 (N). Rio de Janeiro: Miers 8922 (W—1420941). MOUNTED ILLUSTRATIONS: Körn. in Mart., Fl. Bras. 3 (1): pl. 48, fig. 1. 1863 (B, N, Z), pl. 8, no. 9 (B); drawings & notes by Körnicke (B).

PAEPALANTHUS SESSILIFLORUS var. VENEZUELENSIS Moldenke, Phytologia 28: 193—194, fig. A—H. 1974.

Bibliography: Moldenke, Phytologia 28: 193—194, fig. A—H. 1974.

Illustrations: Moldenke, Phytologia 28: 193, fig. A—H. 1974.

Dr. J. A. Steyermark, in a letter to me dated December 9, 1973, says: "Finally I have had the plate made of that eriocaul collection which you believe to be close to Paepalanthus sessiliflorus. It has been very difficult to make the dissections as the flowers are so tiny. However, after a long struggle, the artist with my help and with that of Getulio Agostini, has produced a plate which I am sending you.....You are quite right: it is close to P. sessiliflorus and could be interpreted as a northern variety or perhaps a closely related distinct species.....In attempting to run down the genus in your key on pp. 399—403 [in the Fifth Summary], I found the following discrepancy: the hairs on our plant and in Paepalanthus sessiliflorus are acute at the apex and not granulose nor tuberculate within, but rather smooth. This would place them in 24a. of the key, which runs to Section Leiothriceae, genus Leiothrix. However, the style appendages in P. sessiliflorus and in our plant are inserted at about the same level as the stigmas and between them, as they are supposed to be for Section Paepalanthaeae, genus Paepalanthus of 24 in your key. Therefore, P. sessiliflorus and our plant, according to your key, have the characters of the style appendages and stigma insertion of Paepalanthus of 24 part of your key, but the acute character of the hairs, smooth within, of the Leiothrix, 24a. part of your key. One point: it was difficult to be certain about the nature of the stigmas; at first they appear to be undivided, but with some manipulation appear to break up into 3 linear divisions which appear simple.

I am not certain whether there are 3 other capillary appendages present; if so, they are inserted at about the same level as the stigmas."

Citations: VENEZUELA: Bolívar: Steyermark, Steyermark, Wurdack, Wurdack, & Wishler 106609 (Z-type). MOUNTED ILLUSTRATIONS: Moldenke, *Phytologia* 28: 193, fig. A—H. 1974 (Z).

PAEPALANTHUS SESSILIS H. Lecomte, *Bull. Soc. Bot. France* 55: 596. 1909.

Bibliography: H. Lecomte, *Bull. Soc. Bot. France* 55: 596. 1909; Prain, *Ind. Kew. Suppl.* 4, imp. 1, 170 (1913) and imp. 2, 170. 1958; Moldenke, *Fifth Summ.* 1: 227 (1971) and 2: 958. 1971.

I know nothing about this species except that it was described from and apparently is endemic to Ubangi in the Central African Republic.

PAEPALANTHUS SICAEOFOLIUS Alv. Silv., *Fl. Serr. Min.* 54—55. 1908.

Bibliography: Alv. Silv., *Fl. Serr. Min.* 54—55. 1908; Fedde & Schust. in Just, *Bot. Jahresber.* 46 (2): 4. 1924; Alv. Silv., *Fl. Mont.* 1: 224—225, 233, & 413, pl. 148. 1928; A. W. Hill, *Ind. Kew. Suppl.* 8: 169. 1933; Wangerin in Just, *Bot. Jahresber.* 57 (1): 477. 1937; Worsdell, *Ind. Lond. Suppl.* 2: 184. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 16 & 54. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 88 & 211. 1949; Moldenke, *Résumé* 102 & 490. 1959; Moldenke, *Fifth Summ.* 1: 167 (1971) and 2: 958. 1971; Moldenke, *Phytologia* 26: 197. 1973.

Illustrations: Alv. Silv., *Fl. Mont.* 1: pl. 148. 1928.

This species is based on A. Silveira 362 from "In campis arenosis vel argillosis atque siccis in Serra do Cipó", Minas Gerais, Brazil, collected in April of 1905 and deposited in the Silveira herbarium. Silveira (1928) comments that the "Species ob foliorum formam valde distincta", but it seems to me very greatly to resemble P. rigidulus Mart. in general habit. Irwin and his associates found it growing in wet places in a ravine with steep rocky walls, at 1200 meters altitude, flowering and fruiting in January and describe the plant itself as "cespitose, forming large clumps; inflorescences to 35 cm. tall; heads sordid-white".

Citations: BRAZIL: Minas Gerais: Irwin, Reis dos Santos, Souza, & Fonsêca 22302 (N, Z); A. Silveira 362 (B—*isotype*, Z—*isotype*).

PAEPALANTHUS SILVEIRAE Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 131—132. 1903.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 124, 131—132, & 292. 1903; Prain, *Ind. Kew. Suppl.* 3: 126. 1908; Alv. Silv., *Fl. Mont.* 1: 413. 1928; Moldenke, *Known Geogr. Distrib. Erioc.* 16 & 54. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 88 & 211. 1949; Moldenke, *Résumé* 102 & 490. 1959; Rennó, *Levant. Herb. Inst. Agron. Minas* 71. 1960; Moldenke, *Fifth Summ.* 1: 167 (1971) and 2: 958. 1971; Moldenke, *Phytologia* 30: 325. 1975.

This species is based on A. Silveira 1040 from "in Sümpfen der

Serra do Lenheiro", Minas Gerais, Brazil, flowering in May and deposited in the Berlin herbarium where it was photographed by Macbride as his type photograph number 10646. Silveira (1928) cites A. Silveira 245, also from the Serra do Lenheiro, collected in 1896. The species known thus far only from these two collections.

Ruhland (1903) comments that the "Species cum P. saxatili Koern. affinis. Perigoniorum pili et foliorum indumentum insignia."

Citations: BRAZIL: Minas Gerais: A. Silveira 1040 [Macbride photos 10646] (B—type, N—photo of type, N—photo of type, W—photo of type, Z—isotype).

PAEPALANTHUS SIMILIS Alv. Silv., Fl. Mont. 1: 199—200, pl. 131. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 199—200 & 413, pl. 131. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 131. 1928.

This species is based on A. Silveira 750 from "In arenosis, in Serra do Chapadão", Minas Gerais, Brazil, collected in April of 1925 and deposited in the Silveira herbarium. On page 413 of his work (1928) Silveira emends the type locality citation to "Chapadão prope Serra do Canastra". He comments that the "Species cum P. ramoso, P. Hilairei et P. polyantho affinis". Thus far it is known only from the original collection.

PAEPALANTHUS SINGULARIUS Moldenke, Phytologia 7: 90. 1959.

Bibliography: Moldenke, Phytologia 7: 90. 1959; Moldenke, Résumé 102 & 490. 1959; Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; G. Taylor, Ind. Kew. Suppl. 13: 98. 1966; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Citations: BRAZIL: Pará: Ducke 9109 (Z—type).

PAEPALANTHUS SPATHULATUS Körn. in Mart., Fl. Bras. 3 (1): 389—390. 1863.

Synonymy: Dupatya spathulata (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya spathulata Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 278, 389—390, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4—30): 127, 147—148, 284, & 292. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 16, 31, & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 145. 1959;

Moldenke, Résumé 102, 282, & 490. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 174 & 189. 1969; Moldenke, Fifth Summ. 1: 167 & 486 (1971) and 2: 958. 1971.

The type of this species was collected by Jacques Samuel Blanchet (no. 2600) at Jacobina, Bahia, Brazil, and is deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph number 10647. The species is known thus far only from this original collection.

Citations: BRAZIL: Bahia: Blanchet 2600 (B—type, N—photo of type, N—photo of type, W—photo of type).

PAEPALANTHUS SPECIOSUS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 315. 1863.

Synonymy: Eriocaulon speciosum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 636. 1831. Paepalanthus speciosus Körn. in Mart., Fl. Bras. 3 (1): 315. 1863. Paepalanthus speciosus var. ♂ Körn. in Mart., Fl. Bras. 3 (1): 315. 1863. Dupatya speciosa (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya speciosa Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902. Paepalanthus fenzlianus Körn. ex Moldenke, Résumé 325, in syn. 1959 [not P. fenzlianus Mart., 1974]. Eriocaulon giganteum Riedel ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959 [not E. giganteum Afz., 1856, nor Beauverd, 1909, nor (Beauverd) Beauverd, 1949, nor Mart., 1975].

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 636. 1831; Bong., Ess. Monog. Erioc. 10, 13, & 36. 1831; Steud., Nom. Bot., ed. 2, 1: 586. 1840; Kunth, Enum. Pl. 3: 579 & 614. 1841; Walp., Ann. Bot. Syst. 1: 889. 1849; D. Dietr., Syn. Pl. 5: 268. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 283 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 282, 285, 291, 292, 315—316, 318, 499, & 507, pl. 39—41. 1863; Körn. in Warm., Vidensk. Meddel. Naturh. Foren. Kjöbenh. 23: [309]—310. 1871; Benth. & Hook. f., Gen. Pl. 3 (2): 1022. 1883; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 24 & 27. 1888; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 879 (1893) and imp. 1, 2: 403. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 329. 1898; Malme, Bih. Svensk. Vet. Akad. Handl. 27 (3), no. 11: 27. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4—30): 3, 12, 26, 184, 187—188, 284, 287, & 292. 1903; Fedde & Schust. in Just, Bot. Jahresber. 46 (2): 4. 1924; Herzog in Fedde, Repert. Spec. Nov. 20: 86. 1924; Alv. Silv., Fl. Mont. 1: 190, 192, & 413. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 52. 1930; Stapf, Engl. Lond. 4: 519. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 879 (1946) and imp. 2, 2: 402. 1946; Moldenke, Alph. List Cit. 1: 238. 1946; Moldenke, Known Geogr. Distrib. Erioc. 16, 31, 40, & 54. 1946; Moldenke, Phytologia 2: 374. 1947; Moldenke, Alph. List Cit. 2: 627 (1948) and 4: 1204. 1949; Moldenke, Known Geogr. Distrib. Verbenac.,

[ed. 2], 88, 97, & 211. 1949; Moldenke, *Phytologia* 4: 204—205. 1953; Angely, *Fl. Paran.* 10: 4 & 15. 1957; Durand & Jacks., *Ind. Kew. Suppl.* 1, imp. 3, 145. 1959; Moldenke, *Résumé* 102, 114, 282, 292, 323, 325, & 490. 1959; Moldenke, *Résumé Suppl.* 1: 17 & 22. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 3, 1: 879 (1960) and imp. 3, 2: 402. 1960; Angely, *Fl. Paran.* 16: 66 (1960) and 17: 24. 1961; Eiten in Ferré, *Simpos. Sobre Cerrado* 194. 1962; Moldenke, *Résumé Suppl.* 8: 2 (1964), 11: 4 (1964), and 12: 4 & 11. 1965; Angely, *Fl. Anal. Paran.*, ed. 1, 200. 1965; Hocking, *Excerpt. Bot. A.9:* 290. 1965; Moldenke, *Biol. Abstr.* 46: 3616. 1965; Tomlinson in C. R. Metcalfe, *Anat. Monocot.* 3: 158 & 160. 1969; Moldenke, *Phytologia* 20: 298 & 352. 1970; Moldenke, *Fifth Summ.* 1: 167, 183, & 486 (1971) and 2: 501, 513, 578, 582, 590, & 958. 1971; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1160, map 1781, & *Ind.* 21. 1972; Moldenke, *Phytologia* 26: 197, 229, & 481 (1973), 28: 439, 440, 466, & 467 (1974), 29: 294—296 (1974), 30: 120, 271, & 274 (1975), 31: 385, 387, 403, & 404 (1975), and 33: 27, 34, & 35. 1976.

Illustrations: Körn. in Mart., *Fl. Bras.* 3 (1): pl. 39—41. 1863.

This species is apparently based on L. Riedel 2300, "Habitat in Provincia St. Paulo", Brazil, and doubtless deposited in the Leningrad herbarium. This collection is also the type of *Ericocaulon giganteum* Riedel. Bongard's original (1831) description of the plant is "caulescens; caule simpliciter folioso; foliis lanceolato-acuminatis ciliatis planis; pedunculis fasciculatis subpubescentibus; vaginis laxis trifidis. Tab. LXVII." This description is repeated verbatim by Kunth (1841), who adds the comment that Bongard's plate 67 was never actually published. Probably it exists only in the Leningrad herbarium or library. Körnicke's var. ♂ is described by him as having "foliis in caule elato glabrusculis, demum glaberrimis" and he cites for it the following specimens: Goiás: G. Gardner 4373; Martius 320 & 2300; L. Riedel 2747; Weddell 2131, 2133, & 2134. Mato Grosso: Weddell 3380. Minas Gerais: Weddell 1881. São Paulo: L. Riedel s.n. Ruhland (1903) cites practically the same material: Goiás: G. Gardner 4373; J. E. Pohl 1660 & 1661; L. Riedel 2747. Mato Grosso: Weddell 3380. Minas Gerais: Weddell 1881, 2131, 2133, & 2134. São Paulo: L. Riedel 320 & 2300.

In his 1871 work Körnicke adds Reinhardt s.n. from the Serra do Cipó, deposited in the Copenhagen herbarium, to his var. ♂. He comments that "Praeterea suppetit specimen a cl. Mathieu Libon in Serra do Cipó, prov. Minarum, Octobri lect., quod incompletum certae varietati subjungere non potest. Differt foliis caulinis basi arcte vaginantibus ceterum patentissimis." Silveira (1928) cites A. Silveira 823 from Minas Gerais, and Eiten (1962) cites Eiten & Eiten 2724.

Herzog (1924) avers that the species is related to *P. chiquitensis*. Actually, it also more or less resembles *P. acanthophyl-*

lus Ruhl., P. amoenus (Bong.) Körn., P. applanatus Ruhl., P. bifrons Alv. Silv., P. brasiliensis (Mart.) Mart., P. ciliatus (Bong.) Kunth, P. claussenianus Körn., P. cordatus Ruhl., P. couteöensis Moldenke, P. denudatus Körn., P. divaricatus (Bong.) Kunth, P. falcifolius Körn., P. foliosus Körn., P. formosus Moldenke, P. hilairei Körn., P. ithyphyllus (Mart.) Mart., P. martinianus Körn., P. moldenkeanus R. E. Schult., P. nudus Alv. Silv., P. ochrocephalus Körn., P. plumipes Alv. Silv., P. polyanthus (Bong.) Kunth, P. ramosus (Wikstr.) Kunth, P. rigidus (Bong.) Kunth, P. robustus Alv. Silv., P. sellowianus Körn., P. urbanianus Ruhl., and P. weddelianus Körn.

Körnicker's var. β is now placed in the synonymy of var. tomentosus Alv. Silv. and his var. γ in the synonymy of var. koernickei Ruhl. The P. fenziianus Mart., referred to in the synonymy above, is a synonym of P. amoenus (Bong.) Körn., while Eriocaulon giganteum Afz. is Mesanthemum radicans (Benth.) Körn., the E. giganteum of Beauverd is now known as E. beauverdi Moldenke, and E. giganteum Mart. is Syngonanthus caulescens var. procerus (Klotzsch) Moldenke. The P. bongardianus Mart. and P. fenziianus var. β , sometimes included in the synonymy of typical P. speciosus, are regarded by me as synonyms of var. glaber Ruhl.

Recent collectors have described the typical form of P. speciosus as an erect, unbranched, rosette herb 0.5—3 m. tall [although one label is inscribed "branched"], the stems solitary and simple, the umbels 9—12 inches in diameter, and the flower-heads white, cream-color, gray, or gray-white, in bud brown or brown-black. Anderson says "heads white, main stem unbranched until single large umbel of heads".

Collectors have found the plant growing in open marshes along temporarily dry brooks, in wet campos, campo cerrado, or campos gerais, wet fields, gallery forests and gallery margins, rocky slopes, and cerrado, in sandy or sandy wet soil, in reddish sand of cerrados, in pantanal grassland with Mauritia palms, and on the edge of mound "islands" surrounded by grassy campo, sometimes in association with Xyris lacerata, at altitudes of 400—1600 meters, flowering from February to September and in December, fruiting in May, June, August, and September. Prance and Silva refer to it as a "common caespitose herb". Irwin and his associates found it "locally frequent in wet places on campo", "in cerrado on [mountain] summit and upper slopes", and "in campo in area of cerrado on outcrops with surrounding wet campos and adjacent gallery forest".

Anderson encountered it "in sandy soil of brejo in [an] area of gallery forest, adjacent brejo, and drier higher slopes with grassy campo or rocky cerrado", "on wet hillsides in [an] area of gallery forest and grassy seeping hillsides", and "among rocks on open top of hill in [an] area of hillsides with blocky sandstone outcrops on upper slopes and sandy soil on lower slopes, open grassy cerrado on

[the] lower slopes and larger trees among [the] rocks". Hunt & Ramos refer to it as a "characteristic" plant. The Eitens found it growing in "gently rolling terrain covered with cerrado woodland or scrub, perennial gallery forests along the streams generally separated from the cerrado by a belt of seasonally marshy grassy campo; this plant in the grassy campo on gray silty fine-sand soil; the campo here has grasses, sedges, herbs, and an Ouratea shrub 1 dm. tall, the soil remaining marshy until August, then dries out completely until the rains return in September or October."

Goldsmith 56a is anomalous in having all the bracts dark-margined, light in the center. G. Gardner 4373 in the United States National Herbarium consists of one sheet with typical short ovate stem-leaves and the other sheet with elongate lanceolate stem-leaves (possibly var. attenuatus Moldenke). Malme (1901), whose work is sometimes erroneously cited as "1903", cites Malme 1506 from Mato Grosso and Regnell III.1270 from São Paulo, collected in April and May.

Material of P. speciosus has been misidentified and distributed in some herbaria as P. acanthophyllus Ruhl. or P. amoenus (Bong.) Körn. On the other hand, the Clausen s.n. and Williams & Assis 7265, distributed as P. speciosus, are P. amoenus (Bong.) Körn., Glaziou 19973 is the type collection of P. applanatus Ruhl., Murça Pires, Black, Wurdack, & Silva 6372 & 6373 are P. formosus Moldenke, Harley, Barroso, & al. 11442 is P. phaeocephalus Ruhl., Ratter, Ramos, Castro, Richards, & Argent R.459 is P. speciosus var. angustifolius Ruhl., Irwin, Harley, & Smith 32935, Lützelburg 373, and Philcox & Onishi 4892 are P. speciosus var. attenuatus Moldenke (the first-mentioned being the type collection), Kuntze s.n. [200 m., Velasco, VII.92] is P. chiquitensis Herzog, Weddell 2133 is the type collection of P. speciosus f. calvescens Moldenke, Irwin, Harley, & Smith 33027, Martius 878, Prance & Silva 58214, Sellow s.n., Smith & al. 7074, and Williams & Assis 6969 are P. speciosus var. glaber Ruhl., Philcox & Ferreira 4623 is P. speciosus var. pulverulentus Moldenke, and Kubitzki 71-22 is P. urbanianus Ruhl.

Additional citations: BRAZIL: Distrito Federal: Lourteig 1851 (P); Murça Pires, Silva, & Souza 9376 (Lw); Sucre & Héring 557 (Ac). Goiás: W. R. Anderson 6212 (Ld, N), 8156 (N, N, Z), 10436 (Ld, N), 10461 (Ld, Ld, N, N); G. Gardner 4373 (N, W—937202, W—1066870); Irwin, Grear, Souza, & Reis dos Santos 12560 (Ac, N, W—2759037), 13425 (Ac, N, S, W—2759038), 14532 (Ac, N, W—2759032, W—2759033, W—2759034, W—2759035); Irwin, Souza, Grear, & Reis dos Santos 15542 (Ac, N), 17860 (N, W—2758998); Macedo 1834 (N, Qu, S); L. Riedel 2747 (Ut—379); Weddell 2131 (Br), s.n. (Br). Mato Grosso: Argent, Ramos, Richards, & Souza 6551 (K, K); M. A. Chase 11855 (W—1495703); Eiten & Eiten 8433 (W—2757743); Gold-

Smith 56 (K), 56a (K); Hunt & Ramos 5612 (Ca—1392474, N, N); Irwin, Grear, Souza, & Reis dos Santos 16017 (Ld, N, W—2759036); Irwin & Soderstrom 6552 (N); Irwin, Souza, Grear, & Reis dos Santos 16828 (Ac, N), 17431 (Ld, N); Malme 1506 (S, S, S, S, S, S, S), s.n. [18/7/1902] (S); Nienstedt 119/60a (Ac); Richards, Argent, Ratter, Castro, Ramos, & Souza R.548 (K, K); Weddell 26 (Br), 3380 (Br). Minas Gerais: Maguire, Mendes Magalhães, & Maguire 49187 (N); Weddell 1881 [48] (Br). Pará: Fröes 29896 (Be—79890). Paraná: Dusén 16996 (Br, S, W—1473890). São Paulo: G. Eiten 2724 (N), 2724 bis (Ba); Regnell III 1270 [5—8/5/1848] (S, S, W—200761, W—937197); L. Riedel 2300 (B—isotype, M—isotype); Scheidweiler s.n. (Br). MOUNTED ILLUSTRATIONS: Körn. in Mart., Fl. Bras. 3 (1): pl. 39. 1863 (B, N, Z), pl. 40. 1863 (B, N, Z), pl. 41. 1863 (B, N, Z); drawings & notes by Körnicke (B, B, B). MOUNTED CLIPPINGS: Bong., Ess. Monog. Erioc. 36. 1831 (W).

PAEPALANTHUS SPECIOSUS var. ANGUSTIFOLIUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 187 [as "angustifolia"]. 1903.

Synonymy: Paepalanthus speciosus var. angustifolia Ruhl. in Engl., Pflanzenreich 13 (4-30): 187. 1903. Paepalanthus speciosus angustifolius Ruhl. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 187 & 292. 1903; Alv. Silv., Fl. Mont. 1: 413. 1928; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102, 328, & 490. 1959; Moldenke, Résumé Suppl. 12: 4 & 11. 1965; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 590 & 958. 1971.

Ruhland (1903) describes this variety as "Differt a forma typica foliis basalibus multo angustioribus (3—4 mm latis), brevioribus (15—16 cm longis), utrinque, praesertim supra, fere tomentosopuberulis, longiuscule ciliatis" and cites two collections as cotypes: (1) from Goiás, "in der Nähe der Stadt Goyaz, auf trockenen Campos (Glaziou n. 22317 — blühend im Juli)" and (2) from Minas Gerais, "Serra do Cipó (Mathieu Libon in Herb. Haun. — blühend im Oktober". He further notes that the "Varietas habitu minor quam forma typica". Silveira (1928) cites A. Silveira 676, also from the Serra do Cipó, Minas Gerais.

Recent collectors describe the plant as an herb, 85 cm. to 1 m. tall, with white or creamy-white flowers, and have found it growing on dry or sandy campos, campo cerrado, or, according to Ratter and his associates, "on grassy campo with scattered shrubs (campo sujo) in an area that must be very wet in [the] rainy season", at altitudes of 500—1000 meters, flowering from June to August and in October, fruiting in August. Hatschbach encountered it on a "borda umida de cerrado da encosta de morro".

Material has been misidentified and distributed in some herbaria as typical P. speciosus (Bong.) Körn. and as its var. glaber

Ruhl.

Citations: BRAZIL: Goiás: Glaziou 22317 (B—cotype, Z—cotype); Hatschbach 34631 (Ld), 36877 (Ld); D. R. Hunt 6230 (Ca—1392447, N). Mato Grosso: M. A. Chase 12006 (W—1495704, W—1495705); Ratter, Ramos, Castro, Richards, & Argent R.459 (K, K).

PAEPALANTHUS SPECIOSUS var. ATTENUATUS Moldenke, Phytologia 28: 466. 1974.

Bibliography: Moldenke, Phytologia 28: 439 & 466 (1974) and 29: 296. 1974.

This variety differs from the typical form of the species in having its stem-leaves gradually long-attenuate to the apex and often more or less arcuate-recurved.

Collectors describe this plant as an erect herb, 1—2 m. tall, the flower-heads white, gray, or grayish, and have found it growing on wet campos or "campo aberto", at altitudes of 1100—1250 meters, flowering from December to March and in May, fruiting in February. Irwin and his associates encountered it in "cerrado in an area of campo and cerrado on outcrops" and "occasional in cerrado on [mountain] summit".

Material has been misidentified and distributed in some herbaria as P. amoenus (Bong.) Körn. and as typical P. speciosus (Bong.) Körn.

It should be noted here that one of the two specimens of G. Gardner 4373 in the United States National Herbarium has elongate lanceolate stem-leaves and may possibly represent this variety.

Citations: BRAZIL: Distrito Federal: Héringer 7887/81 (Z); Irwin, Souza, & Reis dos Santos 11580 (N), 11670 (N); Philcox & Onishi 4892 (N). Goiás: Irwin, Harley, & Smith 32935 (Ac—isotype, N—isotype, W—isotype, Z—type); Lützelburg 373 (Mu); Maguire, Maguire, & Murça Pires 44790 (N).

PAEPALANTHUS SPECIOSUS f. CALVESCENS Moldenke, Phytologia 28: 467. 1974.

Bibliography: Moldenke, Phytologia 28: 439 & 467. 1974.

This form differs from the typical form of the species in having its stem-leaves completely glabrous or glabrescent at time of anthesis, but being elongate-ascending as in the typical form.

Irwin & Soderstrom describe this plant as "erect, simple, to 75 cm. tall, heads gray" and found it growing "occasional" at the margins of savanna "islands" at 300—400 meters altitude, flowering and fruiting in October.

Material of this form has previously been misidentified and distributed in some herbaria as typical P. speciosus (Bong.) Körn. or as var. glaber Ruhl.

Citations: BRAZIL: Goiás: Weddell 2133 (Br—isotype, N—type). Mato Grosso: Irwin & Soderstrom 6552 (Ac, N, N).

PAEPALANTHUS SPECIOSUS var. CHLOROCEPHALUS Alv. Silv., Fl. Serr. Min. 50 [as "chlorocephala"]. 1908.

Synonymy: Paepalanthus speciosus var. chlorocephala Alv. Silv., Fl. Serr. Min. 50. 1908.

Bibliography: Alv. Silv., Fl. Serr. Min. 50. 1908; Fedde & Schust. in Just, Bot. Jahresber. 46 (2): 4. 1924; Alv. Silv., Fl. Mont. 1: 190 & 413. 1928; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 58 & 211. 1949; Moldenke, Résumé 102, 328, & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 590 & 958. 1971.

This variety is based on A. Silveira 370 from "In campis aridissimis, locis argilosis" in the Serra do Cipó, Minas Gerais, Brazil, collected in April, 1905, and deposited in the Silveira herbarium. Silveira (1928) describes it as "differt a forma typica praecipue capitulis luteis". It is known thus far only from the original collection.

Citations: MOUNTED CLIPPINGS: Alv. Silv., Fl. Serr. Min. 50. 1908 (W).

PAEPALANTHUS SPECIOSUS var. GLABER Ruhl. in Engl., Pflanzenreich 13 (4-30): 187. 1903.

Synonymy: Paepalanthus speciosus var. glabra Ruhl. ex Alv. Silv., Fl. Mont. 1: 413. 1928. Paepalanthus bongardianus Mart. ex Moldenke, Résumé 323, in syn. 1959. Paepalanthus fenzlianus var. ♀ Körn. ex Moldenke, Phytologia 31: 404, in syn. 1975.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 187 & 292. 1903; Alv. Silv., Fl. Mont. 1: 413. 1928; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke in Dawson, Los Angeles Co. Mus. Contrib. Sci. 7: 6. 1957; Moldenke, Résumé 102, 323, 328, & 490. 1959; Moldenke, Résumé Suppl. 8: 2. 1964; Moldenke, Phytologia 20: 298. 1970; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 590 & 958. 1971; Moldenke, Phytologia 26: 229 (1973), 29: 296 (1974), 31: 385, 403, & 404 (1975), and 33: 27. 1976.

Ruhland (1903) describes this variety as "Differt a forma typica foliis caulinis anguste linearibus (plerumque 10 cm. longis, medio 7--8 mm. latis), juventute jam glaberrimis, nec ciliatis, nec puberulis". He cites as cotypes the following collections, probably all deposited in the Berlin herbarium except where otherwise noted: BRAZIL: Goiás: Burchell 5983 (Mu) & 7029; Glaziou 22319, 22320, & 22322. Minas Gerais: Glaziou 19975 & 19977; Martius s.n. [Minas Novas und in der Serra do S. Antonio]; Reinhardt s.n. (Cp). He comments that "Cum flores, caulis, pedunculus ceterum omnino congruant, varietas species propria non constituenda est. Habitu saepe exilior quam forma typica. Tum pedunculi modo 11--12 cm alti sunt." However, I regard Glaziou 19977 as representing P. urbanianus Ruhl. and Glaziou 22319 as P. acanthophyllus Ruhl., while Glaziou 22322 seems to be a mixture

of P. acanthophyllus and P. speciosus var. glaber.

Paepalanthus bongardianus Mart. is based on Martius 878 in the Munich herbarium where it was photographed by Macbride as his type photograph number 18728; P. fenziianus var. β is based on Sellow s.n. at Berlin.

If my interpretation of var. glaber is valid, recent collectors describe it as an erect caespitose herb, 0.7--2.5 m. tall, simple or few-branched, often solitary, the heads dry, white or grayish, gray-brown in bud, and the flowers white. The label on Anderson 6536 describes the plant as a "shrub 1 m. tall with many stems from one base", but possible this is a case of mixed labels or an error in transcription.

The plant has been found growing in cerrado, on campos or dry campos, "on rocks", on hillsides or in hillside cerrado, in "cerrado on steep rocky hillsides and at top and base of hill", in high campos and forests, in rocky mountain chapada, cerrado adjoining gallery forests, on dry slopes, and in "shaded dry creek in hilly cerrado", at altitudes of 700--1400 meters. It has been collected in anthesis from February to May and in July, August, October, and November, and in fruit in April, May, and August.

Irwin and his associates refer to the plant as "occasional", while Prance & Silva found it "common". It seems to be the typical variety in the Serra do Cipó. Irwin and his associates found it on "campo in area of cerrado on outcrops with surrounding wet campo (brejo) and adjacent gallery forest" and in "wet places on campo in area of gallery forest and adjacent cerrado and campo slopes". Anderson found it "on quartzite rock outcrops and sandy soil with campo" and "in rocky cerrado in region of cerrado with sandstone outcrops giving way above to grassy campo and below to mesophytic forest."

Material of this variety has been misidentified and distributed in some herbaria as P. amoenus (Bong.) Körn. and typical P. speciosus (Bong.) Körn. On the other hand, the Glaziou 22319, distributed as P. speciosus var. glaber, seems better placed as P. acanthophyllus Ruhl., Macedo 3688 is P. claussonianus Körn., D. R. Hunt 6230 is P. speciosus var. angustifolius Ruhl., Irwin & Soderstrom 6552 is P. speciosus f. calvescens Moldenke, and Glaziou 19977 and L. B. Smith 7075 are P. urbanianus Ruhl., while Glaziou 22322 is a mixture of P. acanthophyllus and P. speciosus var. glaber.

Silveira (1928) cites A. Silveira 371 from the Serra do Cipó, collected in 1905.

Citations: BRAZIL: Distrito Federal: Irwin, Grear, Souza, & Reis dos Santos 13925 (N, W--2759001), 15375 (N, W--2759000); Irwin & Soderstrom 5313 (Ld, N, N, N, W--2759039); Murça Pires, Silva, & Souza 9509 (B). Goiás: W. R. Anderson 6536 (Ld, N), 7942 (N), 9409 (Ld, N), 9996 (Ld, N); Burchell 5983 (Br--cotype), 7029 (Br--cotype, N--photo of cotype, Z--photo of cotype); E. Y. Dawson 14271 (Z), 14826 (Lm); Glaziou 22320 (B--cotype, Br--cotype), 22322, in part

(B—cotype); Irwin, Grear, Souza, & Reis dos Santos 12358 (N); Irwin, Harley, & Smith 33027 (Ld, N, W—2709842); Macedo 3246 (Hw, N, S, W—2197068); Prance & Silva 58214 [L. S. 17] (N, N, N, S, W—2457138); L. Riedel 2747 (S); Sick B-650 [Herb. Brad. 4467] (Bd). Maranhão: Krukoff 2052 (Ca—605953, Er, Mi, Mu, N, S, Ut—15916A, W—1661909). Minas Gerais: Black & Mendes Magalhães 51-11754 (Be—69582); Clausen s.n. (N); Glaziou 19975 (B—cotype, B—cotype, Br—cotype, C—cotype); Irwin, Maxwell, & Wasshausen 20239 (N); Martius 878 [Macbride photos 18728] (Mu, N—photo, W—photo); L. B. Smith 6843 (W—2120211, W—2120212), 7073 (W—2120223, W—2120224, Z), 7074 (W—2124678, W—2124679, Z); Williams & Assis 6969 (Ca—744415, N, S, Vi, W—1932862). State undetermined: Murça Pires & Mattos 9804 [Cristalina; Herb. Univ. Bras. 96] (N); Sellow s.n. (B).

PAEPALANTHUS SPECIOSUS var. KOERNICKEI Ruhl. in Engl., Pflanzenreich 13 (4-30): 187—188. 1903.

Synonymy: Paepalanthus speciosus var. γ Körn., Vidensk. Meddel. Naturh. Foren. Kjøbenhavn. 23: 309—310. 1871.

Bibliography: Körn., Vidensk. Meddel. Naturh. Foren. Kjøbenhavn. 23: 309—310. 1871; Ruhl. in Engl., Pflanzenreich 13 (4-30): 187—188 & 292. 1903; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102, 328, & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 590 & 957. 1971.

Ruhland (1903) describes this variety as "Differt a forma typica foliis caespitum sterilium supra tomentoso-pubescentibus. subtus glabris, caulinis glaberrimis" and bases it on Lund 566 from "auf Campos zwischen Catalão und paracata", Minas Gerais, Brazil, flowering in September, and deposited in the Copenhagen herbarium. Thus far the variety is known only from the original collection.

PAEPALANTHUS SPECIOSUS var. PULVERULENTUS Moldenke, Phytologia 10: 489. 1964.

Synonymy: Paepalanthus speciosus var. pulverulentus Moldenke ex Hocking, Excerpt. Bot. A.9: 290, sphalm. 1965.

Bibliography: Moldenke, Phytologia 10: 489. 1964; Moldenke, Résumé Suppl. 11: 4. 1964; J. A. Clark, Card-Ind. Gen. Sp. & Var. Pl. issue 246. 1965; Hocking, Excerpt. Bot. A.9: 290. 1965; Moldenke, Biol. Abstr. 46: 3616. 1965; Schubert, Assoc. Trop. Biol. Bull. 5: 60. 1965; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 590 & 958. 1971; Moldenke, Phytologia 31: 385. 1975.

This variety differs from the typical form of the species in having its stems, leaves, sheaths, and peduncles more or less densely white-pilose with a mealy type of hair which apparently rubs off easily in powdery fashion.

Collectors describe the plant as an herb to 1.5 m. tall, with brown flower-buds, and have encountered it growing on campos,

flowering in March. Material has been distributed in some herbaria as typical P. speciosus (Bong.) Körn.

Citations: BRAZIL: Goiás: E. Pereira 7476 [Herb. Brad. 26298] (Z-type, Z--isotype). Mato Grosso: Philcox & Ferreira 4623 (Ca--1390282, K, K, K, N).

PAEPALANTHUS SPHAEROCEPHALUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 182. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 182 & 292. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 413. 1928; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Phytologia 20: 103. 1970; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971; Moldenke, Phytologia 26: 483. 1973.

This species is based on Glaziou 15546 from "Itacolomy, auf trockenen Campos", Minas Gerais, Brazil, deposited in the Berlin herbarium; an isotype in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva was photographed there by Macbride as his type photograph number 25177.

Ruhland (1903) says of this species "Species P. eriocaloidi Ruhl. valde affinis, sed differt statura humiliore, foliis pedunculorum indumento, perigoniorum forma". He keys three related species apart as follows:

A. Plantae 10--25 cm. altae.

a. Petala floris feminei apice rotundata. P. sphaerocephalus Ruhl.

b. Petala floris feminei apice transverse truncata et plerumque emarginata. P. eriocaloides Ruhl.

B. Planta perexigua, vix 6 cm. alta . . . P. exiguus (Bong.) Ruhl.

These three species comprise his Section Conodiscus.

Mrs. Chase reports finding this plant "in dense little carpets in mossy turf among rocks", at 2798 meters altitude. Hatschbach encountered it on sandy campos. It has been collected in anthesis in May and June and in fruit in May. Silveira (1928) cites A. Silveira 434 from the Serra do Batatal, Minas Gerais, collected in 1906.

It should be noted that the printed label accompanying the type collection is inscribed "Rio de Janeiro", while the longhand (and probably more reliable) one is inscribed "Minas".

Material of P. sphaerocephalus has been misidentified and distributed in some herbaria as Leiothrix echinocephala Ruhl. On the other hand, the E. Pereira 2775 [Pabst 3411], distributed as P. sphaerocephalus, is actually P. eriocaloides Ruhl.

Citations: BRAZIL: Goiás: Hatschbach 36823 (Z). Minas Gerais: M. A. Chase 9714 (W--1282203); Glaziou 15546 [Macbride photos 25177] (B-type, N-photo of isotype, W-photo of isotype, Z-isotype).

PAEPALANTHUS SPHAERULIFER Alv. Silv., Fl. Mont. 1: 103--104, pl. 64. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 103--104 & 413, pl. 64. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 64. 1928.

This species is based on A. Silveira 785, collected "In campis arenosis inter Serro et Diamantina, in Serra Geral", Minas Gerais, Brazil, in June of 1925, and is deposited in the Silveira herbarium. On page 413 of his work (1928) Silveira lists the type locality merely as "Serra Geral" and the year of collection as "1926" -- whether this represents a typographic error or is intended as a correction of the date as given by him on page 104 is not clear. The species is known thus far only from this original collection.

PAEPALANTHUS SPIRALIFOLIUS Alv. Silv., Fl. Mont. 1: 178--179, pl. 115. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 178--179 & 413, pl. 115. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 115. 1928.

This species is based on A. Silveira 824 from "In campis siccis, inter saxa quartzitosa, inter Itacambira et Juramento", Minas Gerais, Brazil, collected in July, 1926, and deposited in the Silveira herbarium. On page 413 of his work (1928) Silveira gives the type locality as just "Itacambira". He comments that "Haec species ob aspectum inflorescentiae typus transitionis inter Polyactides et Actinocephaloides est. Dispositio pedunculorum permittet illam distinguere ab omnibus ipsius sectionis Polyactidis." Thus far, the species is known only from the original collection.

PAEPALANTHUS SPIRIFER Alv. Silv., Fl. Mont. 1: 195--197, pl. 129. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 195--197 & 413, pl. 129. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102 & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 129. 1928.

This species is based on A. Silveira 539 from "In campis siccis arenosisque prope Lagõa Dourada, in Serra do Cipó", Minas Gerais, Brazil, collected in April, 1909, and deposited in the Silveira herbarium. On page 413 of his work (1928) Silveira cites only "Serra do Cipó" as the type locality. He comments that the species is "Ab affinibus foliis caulinis in duas spiras dispositis facile distinguitur".

Citations: BRAZIL: Minas Gerais: Tryon & Tryon 6830 (Z).

PAEPALANTHUS SPIROPHORUS Alv. Silv., Fl. Mont. 1: 175--176, pl. 113. 1928.

Synonymy: Paepalanthus spyrophorus Alv. Silv., Fl. Mont. 1: 414, sphalm. 1928. Paepalanthus pisrophorus Alv. Silv., Fl. Mont. 1: pl. 113, sphalm. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 175--176 & 414, pl. 113. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 16 & 54. 1946; Moldenke, Phytologia 2: 380. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102, 328, & 490. 1959; Moldenke, Fifth Summ. 1: 167 (1971) and 2: 588, 591, & 958. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 113. 1928.

This species is based on A. Silveira 820 from "In campis saxosis. inter Itacambira et Juramento", Minas Gerais, Brazil, collected in July, 1926, and deposited in the Silveira herbarium. On page 414 of his work (1928) Silveira cites the type locality as "Itacambira" and the collection number as "821"; whether this is a misprint, a correction of the number given on page 176, or a record of a second collection, is not clear. Thus far the species is known only from the original collection(s). Silveira says of it "Species ob foliorum dispositionem valde distincta".

PAEPALANTHUS SPIXIANUS Mart., Nov. Act. Physico-med. Acad. Caes.

Leopold.-Carol. Nat. Cur. 17 (1): 14--15 & 42, pl. 1 (I), fig. 1--6. 1835.

Synonymy: Eriocaulon spixianum Steud., Nom. Bot., ed. 2, 1: 586. 1840. Eriocaulon spixianum Mart. ex D. Dietr., Syn. Pl. 5: 260. 1852. Dupatya spixiana (Mart.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya spixiana Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902. Eriocaulon glabratum Mart. ex Moldenke, Phytologia 31: 397, in syn. 1975.

Bibliography: Mart., Nov. Act. Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): [Erioc. Selbst. Pflanzenfam.] 14--15 & 42, pl. 1 (I), fig. 1--6. 1835; Guill. in Deless., Icon. Sel. 3: 58. 1837; Steud., Nom. Bot., ed. 2, 1: 586 (1840) and ed. 2, 2: 247. 1841; Kunth, Enum. Pl. 3: 509--510 & 625. 1841; D. Dietr., Syn. Pl. 5: 260. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 278 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 397--401 & 507. 1863; Kuntze, Rev.

Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 879 (1893) and imp. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 201-203, 284, 287, & 292. 1903; Stapf, Ind. Lond. 4: 519. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 879 (1946) and imp. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 16, 31, 40, & 54. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 88 & 211. 1949; Moldenke, Résumé 102, 282, 293, & 490. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 879 (1960) and imp. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 173, 174, & 189. 1969; Moldenke, Phytologia 20: 306. 1970; Moldenke, Fifth Summ. 1: 167 & 486 (1971) and 2: 513 & 958. 1971; Moldenke, Phytologia 30: 111 (1975), 31: 397 (1975), and 33: 48. 1976.

Illustrations: Mart., Nov. Act. Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): [Erioc. Selbst. Pflanzenfam.] pl. 1 (I), fig. 1-6. 1835.

It should be mentioned here that the Martius (1835) reference cited above is often cited as "1833", but that date is merely the date of submission of the paper as a manuscript; the actual date of its publication was 1835.

This species is based on an unnumbered Martius collection from "in montibus altioribus Provinciae Minarum Brasiliae", collected in May, 1818, and deposited in the Munich herbarium, where it was photographed by Macbride as his type photograph number 18729. This specimen is apparently also the type of Eriocaulon glabratum Mart. Jackson (1893) suggests that the species may be conspecific with Eriocaulon quinquangulare L., but this is completely impossible since the latter is a true species of Eriocaulon with no similarity whatever to this plant.

Kunth (1841) asserts that P. spixianus seems to be closely related to P. corymbosus (Bong.) Kunth, and with this statement I agree fully. Ruhland (1903) cites only the original Martius collection and Langsdorff s.n., also from Minas Gerais, at 1700 m. altitude.

The Martius 874, distributed as P. spixianus in some herbaria, is actually P. vellozioides Körn.

Citations: BRAZIL: Minas Gerais: Martius s.n. [in montibus altioribus, Maio 1818; Macbride photos 18729] (Mu--type, N--photo of type, W--photo of type, Z--isotype); Mello Barreto 2549 [Herb. Jard. Bot. Belo Horiz. 43834] (N). MOUNTED ILLUSTRATIONS: Mart., Nov. Act. Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): pl. 1, fig. 1-6. 1835 (Mu).

PAEPALANTHUS SQUAMULIFERUS Moldenke, Phytologia 2: 380, nom. nud. (1947); Alph. List Cit. 3: 975, hyponym (1949); Fieldiana Bot. 28: 124-125. 1951.

Synonymy: Paepalanthus squamiliferus Moldenke ex J. A. Steyerl.,

Fieldiana Bot. 28: 1157, sphalm. 1957. Leiothrix squamuliferus Moldenke, Phytologia 31: 402, in syn. 1975.

Bibliography: Moldenke, Phytologia 2: 380. 1947; Moldenke, Alph. List Cit. 3: 975. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 64 & 211. 1949; Moldenke, Fieldiana Bot. 28: 124—125. 1951; Moldenke, Phytologia 4: 205. 1953; J. A. Steyermark, Fieldiana Bot. 28: 1157. 1957; Moldenke, Résumé 72, 328, & 490. 1959; G. Taylor, Ind. Kew. Suppl. 12: 101. 1959; J. A. Steyermark, Act. Bot. Venez. 1: 69 & 223. 1966; Moldenke, Fifth Summ. 1: 125 (1971) and 2: 591, 958, & 967. 1971; Moldenke, Phytologia 29: 321 (1974) and 31: 402. 1975.

This species is based on J. A. Steyermark 59777, collected in a Brocchinia-Stegolepis-Heliophora swamp on the southwest-facing shoulder of Ptari-tepuí, at an altitude of 2200 meters, Bolívar, Venezuela, on November 2, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is most remarkable because of the 3 erect scales subtending the base of the ovary. Apparently these represent the very much reduced corollas.

Moore and his associates encountered this plant at 1600—2000 meters altitude, flowering in August, and describe the leaves as glabrous and brittle.

Purists will object to the spelling of the specific epithet employed for this taxon. However, a letter received by me from Dr. H. W. Rickett, dated August 31, 1971, says: "Glancing through [Linnaeus'] Sp. Pl. 1753 I see Fucus sendigerus as well as Dianthus prolifer. In Jackson's 'Glossary', bulbiferus, glanduliferus, spiniferus, spiniger [appear]. In Stearn's 'Vocabulary' bulbilifer, prolifer, glandifer, spinifer [are accepted]. In Nuttall's 'Genera', Cucubalus bacciferus, Astragalus gummifer [are accepted]. So it is best to leave the words as they were published (my usual advice). Forms in -us seem to be respectable, at least in medieval Latin. Of course such words as niger, glaber, integer cannot appear in other form. And procerus is classical Latin."

Material of this species has been misidentified and distributed in some herbaria as Syngonanthus sp.

Additional citations: VENEZUELA: Bolívar: Moore, Ambrose, Dietz, & Pfister 9793 (W--2751698); J. A. Steyermark 59777 (S--isotype), 75951 (Z).

PAEPALANTHUS STEGOLEPOIDES Moldenke, Mem. N. Y. Bot. Gard. 9: 409—410. 1957.

Bibliography: Moldenke, Mem. N. Y. Bot. Gard. 9: 409—410. 1957; Moldenke, Résumé 72 & 490. 1959; G. Taylor, Ind. Kew. Suppl. 13: 98. 1966; Hocking, Excerpt. Bot. A.13: 506. 1968; Moldenke, Résumé Suppl. 16: 6 (1968) and 18: 13. 1969; Moldenke, Fifth Summ. 1: 125 (1971) and 2: 958. 1971; Moldenke, Phytologia 29: 388. 1975.

Citations: VENEZUELA: Bolívar: Steyermark & Wurdack 491 (N).

[to be continued]